

REMARKS

Claims 1, 2, 4-7, 9-14, 17, 23, 25, 29, 31, 33, 34, 36 and 37 are pending in this application. By this Amendment claims 1, 12, 23, 25 and 29 are amended and claims 3, 8, 15, 16, 18-22, 24, 26-28, 30, 32, 35 and 38-47 are canceled without prejudice to, or disclaimer of, the subject matter recited therein. Specifically, independent claim 1 is amended to incorporate the subject matter of canceled claims 3 and 8, independent claim 12 is amended to incorporate the subject matter of canceled claims 15 and 16, and claims 23, 25 and 29 are amended to depend from claim 2. No new matter is added. Reconsideration of this application in view of the above amendments and the following remarks is respectfully requested.

The Office Action indicates that the foreign references, JP-1-225178, JP-6-188455 and JP-5-190893 cited in the February 4, 2005 Information Disclosure Statement have not been considered. Applicants submit that the discussion of these references found on pages 2, 3, 9 and 25 of the originally filed specification constitutes a statement of relevance for these references. Therefore, Applicants request that the Examiner consider these references and return to Applicants' undersigned representatives a fully initialed Form PTO 1449 indicating that the references have been considered.

The Office Action rejects claims 1-11, 20-36 and 45-47 under 35 U.S.C. §112, second paragraph. The rejection of canceled claims 3, 8, 20-22, 24, 26-28, 30, 32, 35 and 45-47 is moot. The rejection of the remaining claims is obviated by the above amendments. Thus, it is respectfully requested that the rejection be withdrawn.

The Office Action rejects claims 1, 2 and 6 under 35 U.S.C. §103(a) over Hsieh et al. (Hsieh), U.S. Patent No. 6,225,648, in view of Toshihiro et al. (Toshihiro), JP-1992-355541. The rejection is respectfully traversed.

As discussed above, independent claim 1 is amended to incorporate the features of claims 3 and 8. The Office Action acknowledges that the combination of Hsieh and Toshihiro fails to disclose these features. Therefore, independent claim 1 and dependent claims 2 and 6 are patentable over the combination of Hsieh and Toshihiro for at least this reason. Thus, it is respectfully requested that the rejection be withdrawn.

The Office Action rejects claim 5 under 35 U.S.C. §103(a) over Hsieh in view of Toshihiro, and further in view of Bass et al. (Bass), "Handbook of Optics - Volume 1, Fundamentals, Techniques, and Design", pages 12.1-12.39, 1995. The rejection is respectfully traversed.

Because claim 5 incorporates the features of independent claim 1, and because Bass fails to overcome the deficiencies of Hsieh and Toshihiro, claim 5 also is patentable over the applied references for at least these reasons, as well as for the additional features that claim 5 recites. Thus, it is respectfully requested that the rejection be withdrawn.

The Office Action rejects claims 3, 4, 7, 8, 12, 14-16, 21-27, 39 and 42 under 35 U.S.C. §103(a) over Hsieh in view of Toshihiro, and further in view of Lakhani, J. Appl. Phys., volume 56, page 1888; 15 September 1984. The rejection of canceled claims 3, 8, 15, 16, 21, 22, 24, 26, 27, 39 and 42 is moot. The rejection of the remaining claims is respectfully traversed.

The combination of Hsieh, Toshihiro and Lakhani does not disclose, and would not have rendered obvious, a light emitting device having a contact layer that is designed to have an In concentration distribution in a thickness-wise direction thereof continuously reducing as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction, wherein a mean In concentration of the contact layer is adjusted within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga, and wherein the contact layer is designed to have C_B/C_A of 0.8 or below, where C_A is In

concentration at a boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at a boundary position on the opposite side, as recited in independent claim 12 and similarly recited in independent claim 1, which incorporates the features of canceled claims 3 and 8.

The Office Action acknowledges that Hsieh does not disclose a contact layer that is designed to have an In concentration distribution in a thickness-wise direction thereof continuously reducing as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction, but cites Toshihiro and Lakashi for the deficiencies.

Toshihiro discloses decreasing a contact resistance by forming an ITO film on an n-GaAs cap layer of an AlGaAs light emitting device, and annealing the layers at 800 degrees C for 5 min (see Fig. 4 and paragraphs [0005] and [0013] of the machine generated translation). Lakhani discloses forming sloping $\text{InGa}_{1-x}\text{As}_x$ by annealing an In film on the n-GaAs (see Fig. 5 and page 1890). The annealing is conducted at 200 to 500 degrees C for 15 to 600 seconds (see Fig. 1 and page 1888). However, both Toshihiro and Lakhani merely improve the ohmic performance of an ohmic contact to n-GaAs. Therefore, according to the teachings of Toshihiro and Lakhani, the higher the In concentration in the $\text{InGa}_{1-x}\text{As}_x$ the better the ohmic performance. That is, Toshihiro and Lakhani do not disclose any upper limit for the In concentration in the $\text{InGa}_{1-x}\text{As}_x$. Therefore, it would not have been obvious to combine Hsieh, Toshihiro and Lakhani to result in Applicants' claimed method and device because doing so would result in an In concentration that is too high at the boundary on the light emitting layer side. As a result, the improving effect for lattice matching would not be sufficient so as to result in a luminance decrease. Therefore, the combination of Hsieh, Toshihiro and Lakhani does not disclose, and would not have rendered obvious, a light emitting device having a contact layer that is designed to have an In concentration distribution in the thickness-wise direction thereof continuously reducing as becoming more distant away

from the ITO transparent electrode layer in the thickness-wise direction, wherein a mean In concentration of the contact layer is adjusted within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga, and wherein the contact layer is designed to have C_B/C_A of 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side, as recited in independent claim 12 and similarly recited in independent claim 1, which incorporates the features of canceled claims 3 and 8. Therefore, independent claims 1 and 12, and their respective dependent claims are patentable over the combination of Hsieh, Toshihiro and Lakhani for at least these reasons. Thus, it is respectfully requested that the rejection be withdrawn.

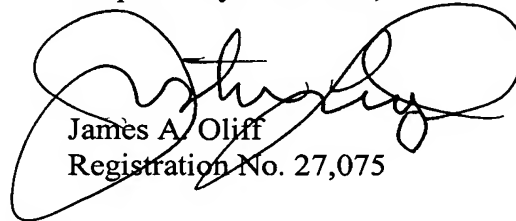
The Office Action rejects claims 9-11, 18, 34, 44, 45 and 47 under 35 U.S.C. §103(a) over Hsieh in view of Toshihiro, and further in view of Saeki, U.S. Patent No. 6,483,127; rejects claims 17, 19, 20, 28-33, 35, 36 and 46 under 35 U.S.C. §103(a) over Hsieh in view of Toshihiro and Lakhani, and further in view of Saeki; and rejects claims 13, 37, 38, 40, 41 and 43 under 35 U.S.C. §103(a) over Hsieh in view of Toshihiro and Lakhani, and further in view of Bass. The rejections of canceled claims 18-20, 28, 30, 32, 35 and 44-47 are moot. The rejections of the remaining claims are respectfully traversed.

Because the remaining claims incorporate the features of independent claims 1 and 12, respectively, and because Saeki and Bass fail to overcome the deficiencies of the other applied references, these claims also are patentable over the applied references for at least these reasons, as well as for the additional features that these claims recite. Thus, it is respectfully requested that the rejection be withdrawn.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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